

## Acquisition



Ornamental germplasm collection trip to the Ukraine. Genera collected included *Betula*, *Cornus* and *Fraxinus*.



Genebank ↔ Genebank

In the early days of the NPGS, germplasm collections grew mostly through plant exploration collection trips. Now genebank to genebank exchanges and acquisition of improved germplasm from researchers contribute to the growth of collections. Better representation of existing taxa and acquisition of new taxa are key priorities because of loss of habitat and instability of resources to support germplasm collections in countries rich in biodiversity.



Rows of field cages

## Regeneration and Pollinator Biology



Insects used for control pollination in cages



Hand pollination of cultivated sunflowers



Hand pollination of squash flowers



Greenhouse regeneration of wild *Cucumis*



Flax



Flax



Sunflower



Sunflower

The NCRPIS has an extensive ex situ regeneration program. Most of the genera maintained at the station are heterozygous, thus requiring pollination controls to maintain gene frequencies found in the original profile of the accession.

## Preservation of Viability



Corn held in medium-term cold storage in plastic jars



Clonally maintained willow germplasm



Germination information captured using a bar-code reader and Oracle software

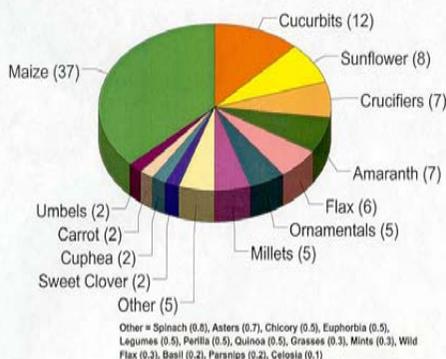


Treating melon seeds with acid to eliminate seed coat borne pathogens

Germplasm at the NCRPIS is maintained either as seeds in cold storage or as plants in the greenhouse or field. Our general-use cold storage rooms are considered medium-term storage while our -20C freezer serves as long term storage for original seeds. Preservation protocols are tailored to individual crop needs. Seeds are prepared for storage by cleaning seeds of debris, running germination tests and performing pathogen-reducing procedures.

## NCRPIS Crops

(% of Total Collection)



Aerial photo of NCRPIS farm



Entrance sign to NCRPIS

## Characterization and Evaluation



Evaluation of sunflower germplasm for resistance to sunflower moths.



Field evaluation for pathogen resistance



ELISA testing for seed health testing and phytosanitary regulations



Ornamental plant germplasm evaluation for adaptation to North Central USA



Molecular marker utilization to identify cultivated sunflower core subset



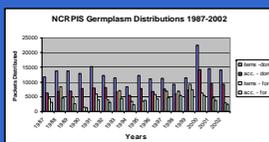
Cucurbit images



Scanned image of Sheep

Current molecular characterization projects include research on: *Coriandrum*, *Brassica napus*, *Zea mays* (popcorn and dent corn), *Helianthus*, and *Echinacea*.

## Distribution



Germplasm distribution 1987 thru 2002



Filling packets in cold storage



Processing packets for shipment

Information on results of germplasm distribution is requested in order to understand how to better serve users and stakeholders.

## Utilization and Enhancement



Cuba X SS Derived Line (S3)

Enhancement of germplasm contributes to the usefulness of germplasm to NPGS cooperators. Identification of valuable traits and germplasm enhancement is key to germplasm utilization.



Cuphea enhancement for use as an industrial crop (non-food)

The project for the germplasm enhancement of maize (GEM) utilizes tropical maize germplasm in concert with combelt adapted commercial material to improve maize genetics.



Research on *Echinacea* for medicinal and nutraceutical use



Selection for wild *Helianthus annuus* for potential sources of resistance to *Alternaria* Leaf Blight and *Septoria* Leaf Blight



Tat Bomasae (S2) maize



A. orientalis (S2) maize



A. apiculatus (S2) maize

Amaranth improvement for agricultural production including development of non-shattering grain types

## Web Resources:

NCRPIS:

<http://www.ars-grin.gov/ars/MidWest/Ames/Sitemap/Sitemap.html>

NC7 Ornamental Trials:

[http://www.ars-grin.gov/ars/MidWest/Ames/Ornamental\\_Trials/](http://www.ars-grin.gov/ars/MidWest/Ames/Ornamental_Trials/)

GEM:

<http://www.public.iastate.edu/%7Eusda-gem/>